Vegetation Gap Analysis for the Region of Peel

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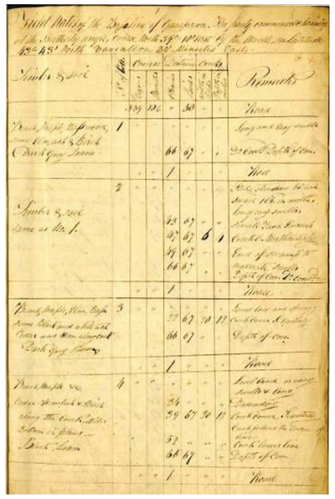
Reconstructing the Pre-settlement Landscape

Knowledge of historical landscapes informs conservation and land use planning decision making. Using vegetation maps, we can identify areas that have been altered from their reference and/or historical ecosystem states and we can assess the naturalness of remnant areas. This study quantifies changes in vegetation and landscape condition numerically and spatially for the Region of Peel, Ontario. This is done by comparing both the pre-settlement and 1950s landscapes to the present condition. In addition to spatial representation and fragmentation, gaps and changes in species composition are examined.



Gap Analysis

Species and ecosystems distributions for three different time steps were compared in a GIS; the pre-settlement condition from the mid 1800s, vegetation in the late 1950s and current conditions.

For the pre-settlement condition, statistical modelling was used to generate species and ecosystems distributions based on information from survey records. 1950s woodlands were derived by digitizing specific features from the historical maps. For the existing vegetation SOLRIS –OMNR mapping was used.

Spatial analysis was conducted to identify and quantify gaps and changes on the landscape. Present land use was also analyzed to determine percent change due to to agriculture and urbanization.

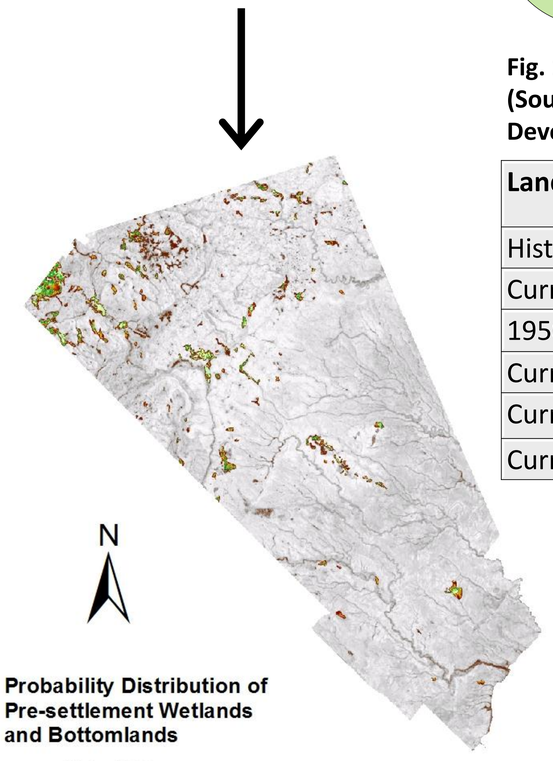
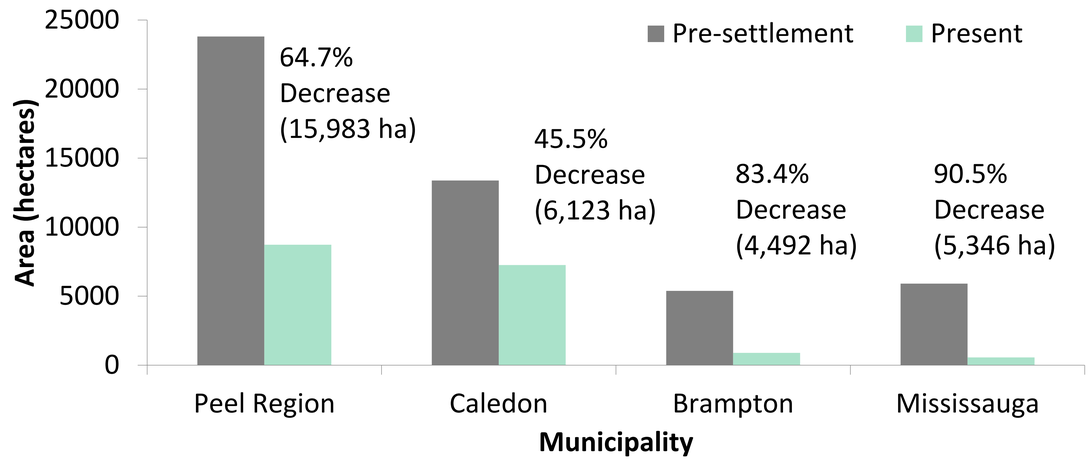


Fig. 1 Proportion of Land Area Occupied by each Landscape Condition Category (Sources: SOLRIS-OMNR, Region of Peel and Ontario Dept. of Planning and Development)

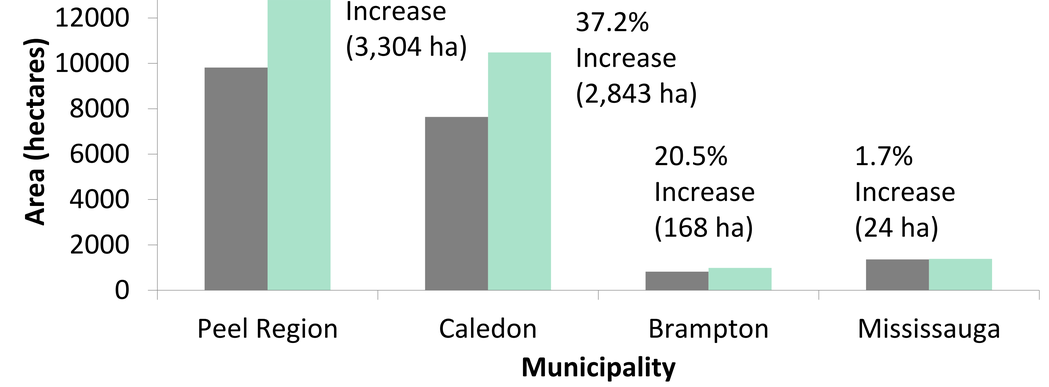
Landscape Condition	Peel Region	Caledon	Brampton	Mississauga
Historical Wetlands	19.7%	19.2%	20.0%	20.3%
Current Wetlands	6.9%	10.4%	3.3%	1.9%
1950s Woodlands	12.2%	21.0%	4.9%	5.0%
Current Woodlands	17.4%	27.2%	5.6%	4.8%
Current Agriculture	45.1%	72.2%	21.9%	1.9%
Current Urban	32.5%	14.3%	44.0%	65.0%

Fig. 2 Change in wetland cover (including bottomlands) from pre-settlement to present



Total area decrease from the pre-settlement condition. The largest decrease is in Mississauga, followed by Brampton and then by Caledon. While, **39.7% (9,186 ha)** of historical wetland cover (including bottomlands) is located in current agricultural areas, **29.1% (7,201 ha)** is located in current urban areas.

Fig. 3 Change in woodland cover from 1950s to present



Total area increase since the 1950s. The largest increase is in Caledon, followed by Brampton and then by Mississauga. While, **56.4% (5,535 ha)** of 1950s woodland cover is located in current agricultural areas, **18.4% (1,810 ha)** is located in current urban areas.

Conclusions

- Historical vegetation maps have a wide range of applications such as: restoration target setting, natural heritage system planning, wildlife management and greenlands securement.
- Wetland conservation and restoration efforts should be part of urban restoration for Mississauga and Brampton, since the results show that wetland decrease in these areas is positively correlated with development and urbanization.
- The increase in woodland cover from the 1950s to present is to some degree due differences in mapping, however it is also the result of past successful restoration programs and planting efforts.
- Target wetland, woodland and native tree restoration efforts in urban areas to support both conservation and urban greening.